Nutritional status and its associated factors among the rural Garo population in Bangladesh.

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Abstract: To achieve good health, high quality of life, and increased national productivity, adequate nutrition is necessary. Ethnic people typically follow a variety of lifestyles and cultural customs. They are therefore significant fields of research. Based on the international body mass index (BMI) cutoff values for adults by age and sex, a cross-sectional study was done to evaluate the nutritional status of the Garo people. Simple random sampling was used to choose the study participants from Modhupur Upazila in Tanthe gail District of Dhaka, Bangladesh. A face-to-face interview was conducted in order to collect data, and a community leader's verbal consent was obtained before the interview. For the Asian population, nutritional status was assessed using the BMI cutoff value. Data on a total of 289 adults (36% were male and 64% were females) aged 18-70 years was included the analysis. In general, 14.9% of people were underweight, 35.3% were normal weight, 33.2% were overweight, and 16.6% were obese. A connection between nutritional status, age group, and occupation was shown to be statistically significant. It is possible to implement an effective nutrition education program.

Keywords: Garo ethnic community**,** nutritional status, BMI, body mass index;

INTRODUCTION:

Nutritional status is a crucial diagnostic indication.[1]. It is a physiological state of an individual that arises from the link between nutrient intake and requirements, as well as from the body's capacity to digest, absorb, and use these nutrients. Anthropometric and biochemical assays, among others, are used to determine nutritional status. Using the body's height and weight, anthropometry evaluates the body's physiological condition.[2] Measuring nutritional status is the first step in developing any strategy to prevent malnutrition because it is a sensitive indicator of community health. In the modern, age malnutrition continues to be a serious public health problem.[3] Despite the apparent economic expansion in developing nations, hunger, and particularly undernutrition, remain major problems.[4] Their social, physical, and nutritional conditions provide bleak portraits of their lives. The nutritional situation of Bangladesh's weaker socioeconomic groups living in the rural areas and urban slums is also, like in most developing nations, far too problematic.[5]

The indigenous people are genetically, culturally, and geographically different from the general population in any society[6]. The Garo population is one of the largest indigenous communities in Bangladesh alone is about 1,50,000 (Bangladesh Bureau of Statistics, 2011) mainly live in the north-eastern part of Bangladesh, with the highest presence in the Gazipur, Mymensingh, Netrokona, Tangail, Sherpur and Jamalpur districts.[7] The sociocultural traditions of the Garos are distinct from those of Bangladesh's majority community. They differ from other tribal communities in terms of their family structure, marriage, ancestral laws, norms, and values, as well as their eating and dressing habits, housing arrangements, languages, and cultural and religious celebrations, among other things. They also, of course, do not follow the traditions of the majority of Bangladeshi commoners.[5]

SUBJECTS AND METHODS:

An observational analytical study was conducted under a cross-sectional design. The subjects, selected by multistage cluster sampling comprised of 106 Garos (age 18-60 years) located in a rural area Pirgacha village, Modhupur upazila of Tangail district. First, we obtained permission from a local community leader by explaining the purpose of the study to him. He then gave us instructions on how to search for Garo adults. Sociodemographic A pretested semi-structured interviewer-administered questionnaire was used to gather the data. Although they speak their own language, the Garo people are fluent in Bangla. Weight was measured using a conventional weighting machine and expressed in kilos. Each individual was instructed to remove their heavy clothing and go barefoot while having their weight measured. Subjects were asked to stand on the platform without shoes, with their heads erect and looking straight ahead, to be measured for height using a conventional height measurement scale. The closest 0.1 cm was used to measure height. For Asian populations, nutritional status was assessed using the BMI cutoff value. When each interview, the questionnaires were thoroughly reviewed, and after all the data had been collected, they were coded before being entered into the computer. After entering the data set into the computer, errors are examined and corrected to the extent possible. This study was self-funded; no outside funding was given to carry it out.

RESULTS:

Of the total 289 subjects, 104 (36%) were male and 185(64%) were females. The mean age of the subjects was 47.5 years with a standard deviation of 11.6 years. Most of the subjects (84.42%) were Christians, whereas only 14.16% were Hindus and 1.4 % were Buddhists. A majority (89 %) of the subjects were married. 23.5 % were illiterate, 29.1 % have completed their primary education, 32.2 % up to SSC and the rest are HSC and above. Among the study subjects, 27.7% were housewives, 13.1% were farmers, 4.5% -day laborers, 10.7% were doing business, 23.1% were service holders, 8% were students and others are 12%. The mean ($\pm$SD) Body Mass Index (BMI) of the subjects was 23.39 ± 5.74 and the mean Waist-Hip Ratio was 0.81 ± **0.**125. About 15% of the subjects were underweight, 35.3% of subjects were within the normal ranges of nutritional status (as assessed by BMI); 33.2% were overweight and 16.6% were obese. About 41.2% of respondents were physically very active (male 61% & female 42%). The source of calorie for the subjects was found to be mostly carbohydrate (73 %), whereas the intake of protein and fat were found to be considerably low (11% & 16% respectively). There was no significant association between nutritional status and calorie intake of the respondents (p-value =.066). In calorie consumption distribution, 47% took under-calorie consumption, 42% took optimum calorie, and 11% took over-calorie. On the cross tab, chi-square analysis occupation is significantly associated with nutritional status among the respondents. On correlation, analysis, a statistically significant association (P value:.05) was found between nutritional status and age group.

Tables and figures of the respondents:

Table 1: Socio-demographics characteristics of the study subjects:

Table 1.1: Distribution of the respondents by age:

Variables	Frequency (n=289)	Percent (%)
30 years and less	62	21.5
31-40	75	26.0
41-50	77	26.6
51-60	42	14.5
61 years and above	33	11.4
Total	289	100.0
Mean ± SD	43.24 ± 14.34	

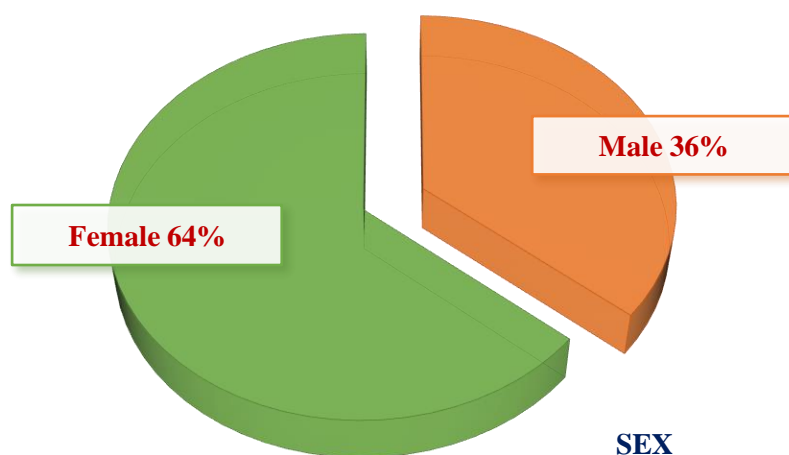**Male 36%**

Female 64%

SEX

Figure 1: Distribution of the respondents by Sex (n=289):

Table 1.2: Distribution of the respondents by religion, marital status, education, Family members

Variables	Frequency (n=289)	Percent (%)
Religion		
Hindu	41	14.18
Buddhist	4	1.4
Christian	244	84.42
Marital status		
Married	257	88.9
Unmarried	26	9.0
Widowed	6	2.1
Education		
Illiterate	68	23.5
Primary	84	29.1
SSC	93	32.2
HSC	29	10.0
Graduate	12	4.2
Post graduate	3	1.0
Family Members		
1-2	22	7.6
3-4	111	38.4
5-6	113	39.1
More than 6	43	14.9

Table 1.3: Socio-economic characteristics of the respondents:

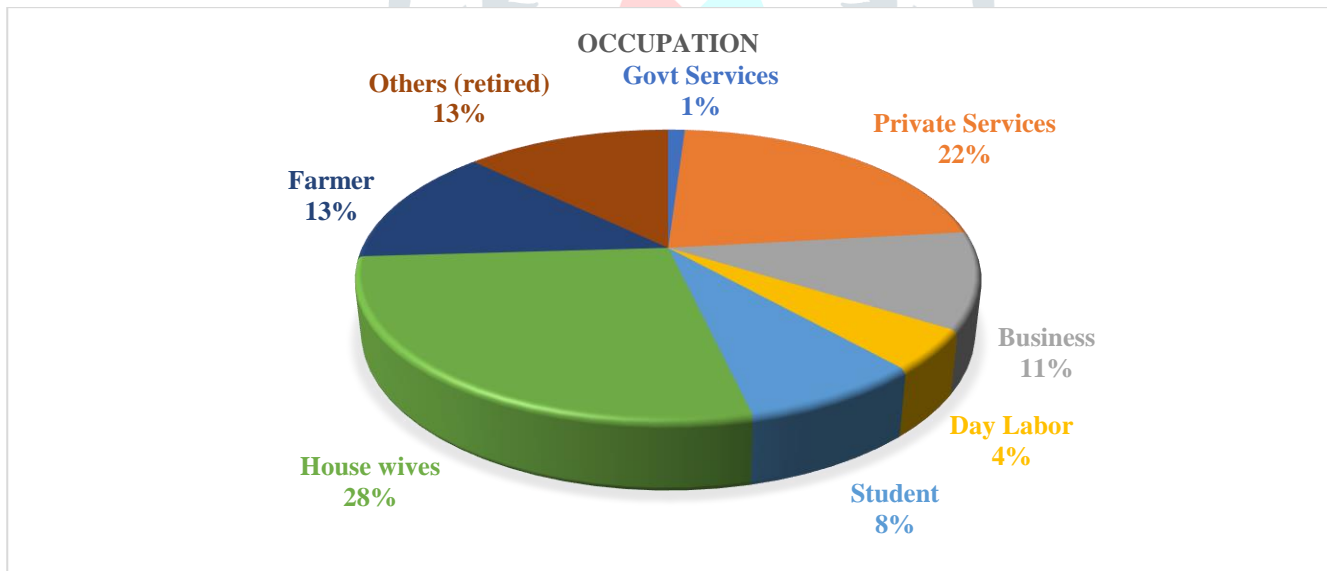| Income	Frequency (n=289)	Percentage (%)
Less than 10000	70	24.2
10000-20000	126	43.6
20000-30000	53	18.3
30000-40000	24	8.3
More than 40000	16	5.5
Expenditure	**Frequency (n=289)**	**Percentage (%)**
Less than 10000	82	28.4
10000-20000	139	48.1
20000-30000	43	14.9
30000-40000	13	4.5
More than 40000	12	4.1

Figure 2: Distribution of the respondent by Occupation level (n=289):

Table 2: Anthropometric characteristics of the study population:

Variables	Mean ± SD
Weight (Kg)	57.08 ± 12.16
Height (cm)	156.80 ± 9. 60
BMI (kg/m²)	23.39 ± 5.74
Waist hip ratio	0.81 ± 0.13

Table 3: Total Calorie intake by the study subjects (n=289):

Variables	Total Calorie Intake			% Of Total Calorie
	(Mean ± SD)	Median	Moderate	
Calorie from CHO	1364.85 ± 502.66	1219.56	1170.00	73.10 ± 6.17
Calorie from Fat	293.16 ± 102.25	274.00	171.00	16.33 ± 6.03
Calorie from Protein	195. 69 ± 67.92	185.00	291.24	10.57 ± 2.33
Total Calorie	1853.70 ± 582.25	1704.00	2231	100.00
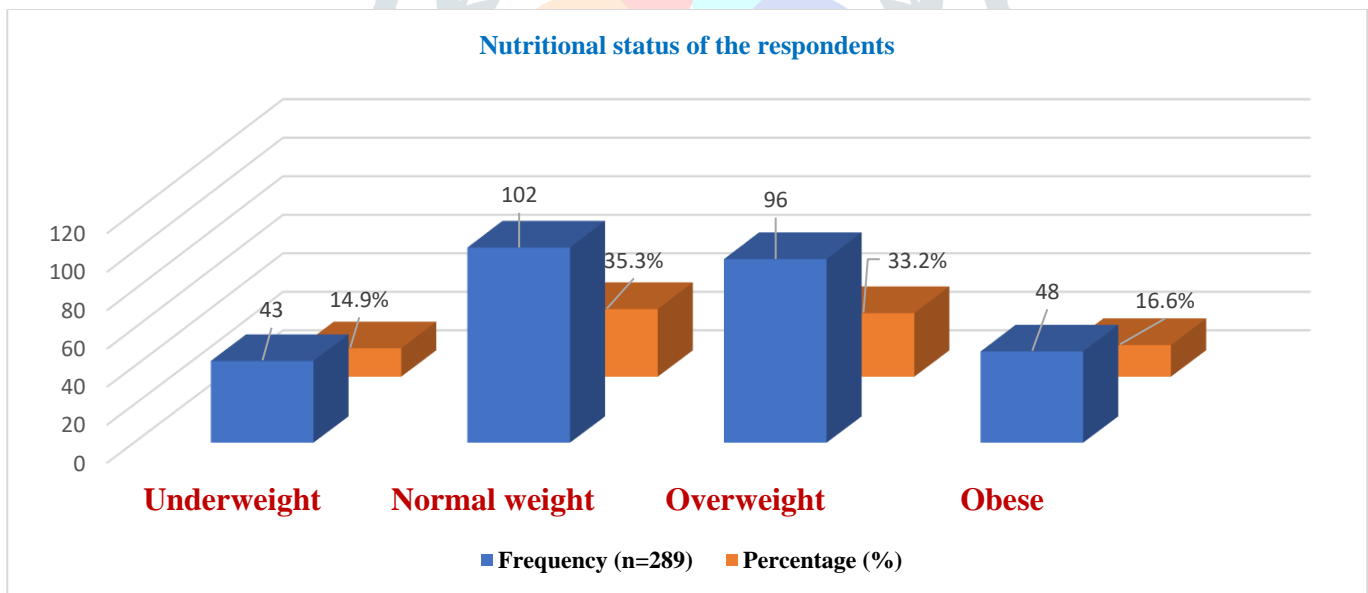
Figure 3: Nutritional Status (by Body Mass Index) of the study subjects

Table 4: Gender-wise distribution of the nutritional status among the subjects (n=289):

Variables		Male	Female	Total	χ2	P Value
		N (%)	N (%)	N (%)		
BMI	Underweight	16 (15.4)	27 (14.6)	43 (14.9)	2.680	.222
	Normal weight	36 (34.6)	64 (34.6)	100 (34.6)		
	Overweight	39 (37.5)	58 (31.4)	97 (33.6)		
	Obese	13 (12.5)	36 (19.5)	49 (17.0)		
	Total	104 (100)	185 (100)	289 (100)		

Table 5: Association between nutritional status and age:

Variables		Under weight	Normal weight	Over weight	Obese	Total	χ2	P Value
		N (%)	N (%)	N (%)	N (%)	N (%)		
Age	30 yrs and less	13(30.2)	23 (23.0)	14 (14.4)	12 (24.5)	62 (21.5)	10.8	0.274
	31-40	8(18.6)	26 (26.0)	28 (28.9)	13 (26.5)	75 (26.0)		
	41-50	8(18.6)	23(23.0)	31(32.0)	15(30.6)	77(26.6)		
	51-60	9 (3.1)	15 (5.2)	13 (4.5)	5 (1.7)	42 (14.5)		
	61 yrs. & above	5 (11.6)	13 (13.0)	11(11.3)	4 (8.2)	33 (11.4)		
	Total	43(100)	100 (100)	97 (100)	49 (100)	289 (100)		

Table 6: Association between nutritional status and occupation:

Variables		Under weight	Normal weight	Over weight	Obese	Total	χ2	P Value
		N (%)	N (%)	N (%)	N (%)	N (%)		
Occupation	Service holder	8(18.6)	29 (28.4)	22 (22.9)	8 (16.7)	64(22.1)	44.06	0.001
	Business	3 (6.9)	9 (8.82)	12 (11.8)	7 (14.6)	31(10.7)		
	Day labor	1 (2.3)	7 (6.86)	4 (3.9)	1 (2.0)	13 (4.5)		
	Student	9 (21.0)	8 (7.84)	3 (3.1)	3 (6.3)	23 (8.0)		
	Housewives	5 (11.6)	20 (19.6))	33 (34.4)	22 (45.8)	80 (27.7)		
	Farmer	6 (13.9)	17 (16.66))	13 (13.5)	4 (8.3))	38 (13.1)		
	Others	11(25.6)	12 (11.76)	10 (10.4)	3 (6.25)	37 (12.8)		
	Total	43 (100)	102 (100)	96 (100)	48 (100)	289 (100)		

Table 7: Association of nutritional status (according to BMI) between age and total calorie by correlation analysis:

Variables	Age of the respondents		Total calorie intake	
	Correlation coefficient (r)	P-value	Correlation coefficient (r)	P-value
BMI	0.112	0.05	-0.083	0.159

Correlation is significant at the 0.01 level (2-tailed).

Correlation is significant at the 0.05 level (2-tailed).

DISCUSSION:

There are up to 30 tribal communities residing in Bangladesh.[8] One of them is the Garo. They primarily reside in our country's Mymensingh, Netrokona, Taogail, Sylhet, and Sunamgonj districts. The findings of this study were 14.9% underweight, 34.6% normal weight, 33.6% overweight and 17% were obese However, Haque et al. in 2014 discovered that 15% were obese, 22% were overweight, and 46% were normal weight.[9] Actually, the participants in our study included Garo population living on a plain. whether the study by Haque et al. was carried out in mountainous terrain.[10] Our study findings showed nutritional status was significantly associated with occupation (χ2=0.44, p-value =0.001)**.** On correlation analysis, nutritional status was a significant association with age (P=0.05).　On the other hand, a study among Garos in Bangladesh showed Age group, education level, and occupation all had a significant impact on nutritional status (p<0.05). A connection between malnutrition and monthly household income is revealed using a multivariate study.[11] Our study did not show any relation between nutritional status and dietary calorie intakes. To obtain a more accurate outcome, research on dietary intake and physical activity might be added. Future research could include specifics to produce more accurate results.

CONCLUSION:

This study painted a bleak picture of the nutritional condition of the Garo population. A connection between nutritional status, age group, and occupation was shown to be statistically significant. It is possible to implement an effective nutrition education program. Further research may give clearer picture of their health and nutritional condition.

CONFLICT OF INTEREST:

According to the author, there is no conflict of interest.

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